Call for an experimental Nuclear Physics Post-Doc at GANIL

Duration: 2 years starting in first trimester 2019

1 Context

The Advanced GAmma Tracking Array (AGATA) is the next-generation high-resolution γ-ray spectrometer that is presently being constructed in Europe. It has passed its early demonstrator phase, where it consisted of 15 High-purity germanium detectors, and is growing towards a 4π array of 180 detectors, with the aim of completion at 2030.

AGATA is considered as a key instrumentation for future nuclear structure research in Europe and will/might be used at the main European nuclear physics laboratories such as GANIL, FAIR, HE-ISOLDE, SPES, and Jyvaskyla. At these facilities a plethora of different types of experiments will be performed ranging from low γ-ray multiplicities with high ion velocities to high-spin high experiments. It is therefore of great importance to the European nuclear physics community that AGATA performs at its best. In this context the ANR project "Optimization of AGATA science production" (OASIS) has been mounted. It is a two-legged project with one leg aiming at improving the basic ingredients of AGATA, i.e. pulse-shape analysis and γ-ray tracking, and a second leg aiming at optimizing the use of AGATA.

As AGATA is presently installed at GANIL and will remain there over the period covered by the OASIS project, the development work on AGATA proposed to this post-doc will be performed in parallel to the AGATA experimental campaign to which the post-doc will take an active part.

2 Post-Doc project

The post-doc project aims at implementing advanced γ-ray spectroscopy methods that have been in use in standard γ-ray spectrometers (such as EUROGAM, EUROBALL, or Gammasphere) in AGATA. With the increased number of modules in the AGATA array, the covered solid angle will allow to use advanced spectroscopy methods and tools to address in more details the structure of the nucleus. The successful candidate will characterize the response function of AGATA to specific observables using source and in-beam data taken during the different AGATA campaigns, and make it available for the collaboration and AGATA users. More precisely the work will consist in verifying the procedures and providing functional codes to the community for the following set of techniques:

• Efficiency as function of fold and γ-ray energy.
• Peak-to-total ratio as function of fold and γ-ray energy.
• Determination of angular correlations and distributions.
• Deconvolution of continuous γ-ray distributions.
• …

This work will be done with vivid exchanges of information with the part of the OASIS team in charge of improving the algorithms for pulse-shape analysis, γ-ray tracking and simulation. In parallel the post-doc will analyze a specific dataset with the goal of extracting physics results. Several possibilities exist and this will be defined with the chosen candidate.

The successful candidate will take part in the experimental campaign of AGATA at GANIL and will be involved in the physics program developed by the high-resolution gamma ray spectroscopy group of GANIL using AGATA. The candidate will be fully involved in the setting,

running and analysis of the AGATA array during its stay at GANIL with a main focus on the MUGAST-campaign.

Applicants should have a Ph.D. in experimental nuclear physics and a proven track record in leading nuclear physics experiments, analyzing the data and publishing the results in a timely manner. The successful candidate will also have good experience in preparing nuclear spectroscopy experiments with large detector arrays coupled to ancillary detectors. The successful candidate should also have experience of computer programming (C, C++). The interested candidates should contact Emmanuel Clément (clement@ganil.fr). A motivation letter, curriculum vitae and two reference letters are required. Review of applications will begin immediately and the deadline is 30th of November 2018.